Monotone Methods for Equilibrium Selection under Perfect Foresight Dynamics (Mathematical Economics)

Oyama, Daisuke; Takahashi, Satoru; Hofbauer, Josef

数理解析研究所講究録 1391 巻 2004 年 118-118

Monotone Methods for Equilibrium Selection under Perfect Foresight Dynamics

DAISUKE OYAMA
Graduate School of Economics, University of Tokyo
oyama@e.u-tokyo.ac.jp

SATORU TAKAHASHI
Department of Economics, Harvard University
stakahas@fas.harvard.edu

JOSEF HOFBAUER
Department of Mathematics, University of Vienna
Josef.Hofbauer@univie.ac.at

Abstract

This paper studies equilibrium selection in supermodular games based on perfect foresight dynamics. A normal form game is played repeatedly in a large society of rational agents. There are frictions: opportunities to revise actions follow independent Poisson processes. Each agent forms his belief about the future evolution of the action distribution in the society to take an action that maximizes his expected discounted payoff. A *perfect foresight path* is defined to be a feasible path of action distribution along which every agent with a revision opportunity takes a best response to this path itself. A Nash equilibrium is said to be *absorbing* if there exists no perfect foresight path escaping from a neighborhood of this equilibrium; a Nash equilibrium is said to be *globally accessible* if for each initial distribution, there exists a perfect foresight path converging to this equilibrium. By exploiting the monotone structure of the dynamics, a unique Nash equilibrium that is absorbing and globally accessible for any small degree of friction is identified for certain classes of supermodular games. For games with monotone potentials, the selection of the monotone potential maximizer is obtained. Complete characterizations of absorbing equilibrium and globally accessible equilibrium are given for binary supermodular games. An example demonstrates that unanimity games may have multiple globally accessible equilibria for a small friction.

THE PAPER IS AVAILABLE AT:
`http://www.e.u-tokyo.ac.jp/~oyama/papers/supmod.html`